Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
For
Sturbridge Isle

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program

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June 26, 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Sturbridge Isle
PWS Address	400 Route 15
City/Town	Sturbridge, Massachusetts
PWS ID Number	2287024
Local Contact	Mr. James Majewski
Phone Number	(888) 377-7678

Well Name	*Source ID#*	*Zone I (in feet)*	*IWPA (in feet)*	*Source Susceptibility*
Well #1	2287024-01G	355	1520	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:
This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:
1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas
5. Appendix

1. Description of the Water System

The well for the facility is located a few feet south of a pond that is located on the east side of the main on-site building. The well has a Zone I of 355 feet and an Interim Wellhead Protection Area (IWPA) of 1,520 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA. The well serving the facility is treated with potassium hydroxide for pH adjustment. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by **the** water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone I;**
2. **Wastewater Treatment Facility;**
3. **Gas Station/ Service Station/Underground Storage Tank;**
4. **Transportation Corridors; and**
5. **Lawncare & Gardening**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of at least one high threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone Is –** Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains parking, driveways. The public water supplier owns and controls all land encompassed by the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

2. **Wastewater Treatment Plant/ drainfield** – The on-site wastewater treatment plant is located within the IWPA of the well. Improper management of wastewater and spills, leaks, improper handling or storage of treatment plant chemicals, sludge, chemicals and equipment maintenance materials can potentially contaminate the water supply. Hazardous materials discharged to the drainfield can contaminate the groundwater.

Recommendation:

✓ Maintain increased vigilance in Best Management Practices for the wastewater treatment plant due to its proximity to the Well.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Parking lot, driveways & roads	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Gas Station/Service Station	No	Yes	High	Automotive vehicle fluid spills
Bus & Truck Terminal	No	Yes	High	Automotive vehicle fluid spills
Underground Storage Tanks	No	Yes	High	Diesel & gasoline
Drainfield for wastewater	No	Yes	Moderate	See septic systems brochure in the appendix
Lawncare/Gardening	No	Yes	Moderate	Fertilizer, Herbicide & Pesticide Use
Transportation Corridor	No	Yes	Moderate	Route I-90 & Route 84
Wastewater Treatment Facility	No	Yes	High	Treatment Chemical or equipment maintenance materials

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

- ✓ Drainfield components should be located, inspected, and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- ✓ Never allow hazardous materials to enter drainfield.

3. **Gas Station/ Service Station/ Underground Storage Tank (UST)-** USTs with diesel and gasoline are located at a gas station within the protection area. If managed improperly, USTs can be a potential contaminant source due to leaks or spills of the chemicals they store. Activities associated with vehicle maintenance have the potential to contaminate groundwater.

Recommendations:

- ✓ Work with the gas station to encourage them to comply with all provisions of the regulations regarding USTs. Consult with the local fire department for any additional local code requirements regarding USTs.
- ✓ Any modifications to the USTs must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements.
- ✓ Any floordrains in vehicle maintenance areas must comply with DEP's Underground Injection Control Regulations 310 CMR 27.00.

4. **Transportation corridor -** Route I-90 and Route 84 are located within the IWPA of the well. Interstate highways are potential sources of contamination due to salting of roadways and leaks or spills of fuels and other hazardous materials during accidents.

Recommendations:

- ✓ Encourage Massachusetts Highway Department to reduce road salt usage within the IWPA.
- ✓ Map stormwater drainage within IWPA and provide drainage patterns to emergency responders.
- ✓ Contact local fire department to ensure that the IWPA is included in Emergency Response Planning

5. **Lawncare & Gardening -** Fertilizer is applied to the lawn that is located within the IWPA. Fertilizers and pesticides, if improperly applied or stored, can be potential sources of contamination to the water supply.

Recommendations:

- ✓ Use best management practices when applying fertilizer in the IWPA.
- ✓ Do not use fertilizers or pesticides in the Zone I.

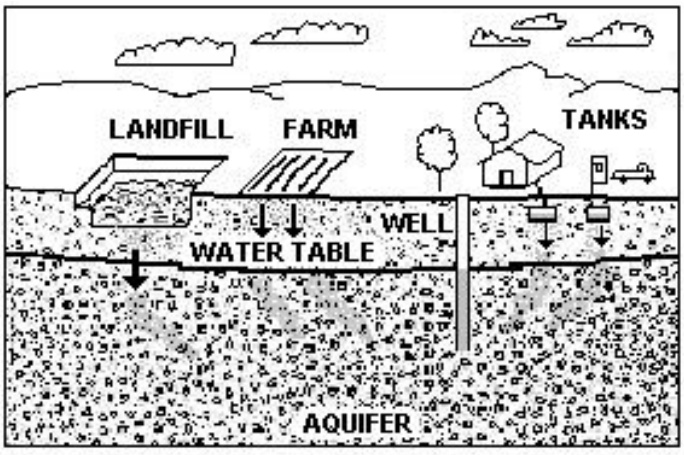

Figure 1: Example of how a well could become contaminated by different land uses and activities.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination.. Sturbridge Isle should review and adopt the key recommendations above and the following:

Zone I:

- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the well and pumphouse by locking facilities, gating roads, and posting signs.

For More Information:

Contact Josephine Yemoh-Ndi in DEP's Worcester Office at (508) 792-7650 x 4030 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at: www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, and certified operator. Post labels as appropriate on raw materials and hazardous waste.

Facilities Management:

- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Ensure all automotive fluids are properly managed.

Planning:

- ✓ Work with local officials in Sturbridge to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Industrial Floordrain Brochure